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10/678,211	10/03/2003	Cem I. Duruoz	SONY / 55DV	2163

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EXAMINER	
ADEGEYE, OLUWASEUN	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 10/678,211	**Applicant(s)** DURUOZ ET AL.	
	Examiner OLUWASEUN A. ADEGEYE	**Art Unit** 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/03/2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 - 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 - 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/03/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1 and 13 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 – 5, 7 – 8 and 13 – 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Comer (US 6,201,297 B1) in view of Schultz et al (US 6,453,114 B2).

As to **claim 1**, Comer discloses a method of managing the decoding and display of digital video in a plurality of modes (forward play mode and reverse play mode) (see column 3, lines 10 – 13) including at least one mode (reverse play mode) in which frames of digital video are displayed in other than their original order (see column 3, lines 32 – 54) or certain frames are not displayed, using a plurality of buffers (310, 320, 330, 340, 350, 360, 370) each for storing a frame of decoded digital video data for display (see fig. 2 and column 3, lines 13 – 31), comprising

preliminary to decoding a frame of digital video data, selecting a decode buffer(310, 320, 330, 340, 350, 360, 370) for storage of the decoded digital video data without regard to a current playback mode or type of video frame being decoded (see fig. 2 and column 3, lines 13 – 31) ,

preliminary to displaying a frame of digital video data, selecting a display buffer(310, 320, 330, 340, 350, 360, 370) from which digital video data is to be displayed (see column 3, lines 13 – 31 and column 5, lines 50 – 57),

decoding a frame of digital video data into the selected decode buffer (see column 3, lines 13 - 31), and

displaying a frame of digital video data from the selected display buffer (see column 3, lines 32 – 55).

Comer discloses wherein the digital video data includes an intra-coded (I) type and a predicted (P) type (see column 3, lines 32 – 51).

Comer does not disclose wherein the digital video data comprises frames of an intra-coded (I) type, a predicted (P) type and bi-directionally coded (B) type, and frames of all three types are decoded, buffered and displayed in accordance with the method.

Schultz discloses wherein the digital video data comprises frames of an intra-coded (I) type, a predicted (P) type and bi-directionally coded (B) type, and frames of all three types are decoded, buffered and displayed in accordance with the method (see column 1, line 65 – column 2, line 18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the step of decoding and buffering B pictures as taught by Schultz to the apparatus of Comer to provide opportunities for improved trick mode reproduction (see column 2, lines 28 – 32).

As to **claim 13**, Comer discloses a method of managing the decoding and display of digital video in a plurality of modes (forward play mode and reverse play mode) (see column 3, lines 10 – 13) including at least one mode in which frames of digital video are displayed in a reverse order (reverse play mode) (see column 3, lines 32 – 54) , using a plurality of buffers(310, 320, 330, 340, 350, 360, 370) each for storing a frame of decoded digital video data for display(see fig. 2 and column 3, lines 13 – 31) , comprising

displaying a current video frame (I(N)) from a first frame buffer (310) (see column 3, lines 13 – 16 and column 3, lines 38 – 40) ,

decoding digital video frames preceding said current video frame in forward order (see column 3, lines 3 – 6 and column 3, lines 17 – 20), until at least respective second (320) and third (330) frame buffers are respectively storing first (I(N-1)) and second (P(N-3)) prior video frames preceding said current video frame in forward order (see fig. 2 and column 3, lines 13 – 27), and then

displaying said first prior video frame (I(N)) from said second frame buffer (320) without re-decoding said first prior video frame (see column 3, lines 44 – 48), and

displaying said second prior video frame (P(N-3)) from said third frame buffer (330) without re-decoding said second prior video frame (see column 3, lines 43 – 44).

Comer does not disclose wherein the digital video data comprises frames of an intra-coded (I) type, a predicted (P) type and bi-directionally coded (B) type, and frames of all three types are decoded, buffered and displayed in accordance with the method.

Schultz discloses wherein the digital video data comprises frames of an intra-coded (I) type, a predicted (P) type and bi-directionally coded (B) type, and frames of all three types are decoded, buffered and displayed in accordance with the method (see column 1, line 65 – column 2, line 18).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the step of decoding and buffering B pictures as taught by Schultz to the apparatus of Comer to provide opportunities for improved trick mode reproduction (see column 2, lines 28 – 32).

As to **claim 2**, Comer in view of Schultz discloses the method of claim 1. Comer discloses further comprising, preliminary to selecting a decode buffer and decoding a frame of digital video data into the selected decode buffer, determining whether to release any of said buffers and which buffer to release (column 3, lines 12 – 51 discloses a reverse play speed mode and the buffers that are used during the operation).

As to **claim 3**, Comer in view of Schultz discloses the method of claim 2 . Comer discloses wherein the determination whether to release any of said buffers is based on a current playback state (reverse play speed mode) (column 3, lines 12 – 51 discloses a reverse play speed mode and the buffers that are used during the operation).

As to **claim 4**, Comer in view of Schultz discloses the method of claim 3. Comer discloses wherein in a PLAY, SLOW FORWARD, FAST FORWARD or REVERSE DECODE (reverse play speed mode) state the buffer holding the second last reference frame decoded is released when a reference frame is being decoded (column 3, lines

38 – 40 discloses storing frame (I(N-2)) in the first frame buffer since frame (I(N)) has been displayed), and the buffer holding the last non-reference frame (P(N-2)) decoded is released when a reference frame (I(N-2))is being decoded (see column 3, lines 35 – 38).

As to **claim 5**, Comer in view of Schultz discloses the method of claim 1. Comer discloses wherein selecting a decode buffer comprises determining whether there are any free buffers and if so selecting a free buffer for said decode buffer (see column 3, lines 27 – 31), and otherwise selecting a buffer storing digital video data currently being displayed for said decode buffer (column 3, lines 38 – 40 discloses storing frame (I (N-2)) in the first frame buffer since frame (I (N)) has been displayed).

As to **claim 7**, Comer in view of Schultz discloses the method of claim 1. Comer discloses wherein in a first playback state; said display buffer is selected based on temporal references of data stored in said buffers (see column 6, lines 10 – 34).

As to **claim 8**, Cower in view of Schultz discloses the method of claim 7. Comer discloses wherein said first playback state is a REVERSE DECODE or FAST REVERSE (reverse three times play speed mode) playback state (see column 3, lines 12 – 14).

As to **claim 14**, Comer in view of Schultz discloses the method of claim 13. Comer discloses further comprising decoding at least one additional prior digital video frame (P(N-3)) preceding said first (I(N)) and second (I(N-1)) prior video frames in forward order (see column 3, lines 3 – 6 and column 3, lines 13 – 25).

As to **claim 15**, Comer in view of Schultz discloses the method of claim 14. Comer discloses wherein decoding said at least one additional prior digital video frame (I (N-2)) is performed while said first prior video frame (P (N-2)) is being displayed (see column 3, lines 32 – 38).

As to **claim 16**, Comer in view of Schultz discloses the method of claim 14. Comer discloses wherein decoding of said at least one additional prior digital video frame continues (I (N-2)) until at least one frame buffer is storing (P(N-6)) said at least one additional prior digital video frame (see column 3, lines 36 – 43).

As to **claim 17**, Comer in view of Schultz discloses the method of claim 14. Comer discloses wherein said at least one additional prior digital video frame (I(N-2)) is decoded into said first frame buffer (see column 3, lines 38 – 40).

As to **claim 18**, Comer in view of Schultz discloses the method of claim 14. Comer discloses further comprising, prior to decoding said at least one additional prior digital video frame, requesting delivery, from a host, of encoded digital video data needed to decode said at least additional prior digital video frame (see column 5, lines 19 – 32).

As to **claim 19**, Comer in view of Schultz discloses the method of claim 18. Comer discloses wherein requesting delivery of encoded digital video data comprises identifying an MPEG VOBU or GOP (see column 3, lines 1 – 11) needed to be decoded in forward order to decode said at least one additional prior digital video frame.

As to **claim 20**, Comer in view of Schultz discloses the method of claim 19. Comer discloses wherein an MPEG VOBU or GOP including said first and second prior digital video frames is identified (column 1, lines 37 – 47 discloses I, B and P frames).

As to **claim 21**, Comer in view of Schultz discloses the method of claim 20. Comer discloses wherein an MPEG VOBU or GOP prior to the VOBU or GOP including said first and second prior digital video frames is also identified (column 1, lines 37 – 47 discloses I, B and P frames) .

4. Claims 9 – 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Comer in view of Schultz as applied to claims 1 and 13 above, and further in view of Wu et al (US 6,473,558 B1).

As to **claim 9**, Comer in view of Schultz discloses the method of claim 1. Comer discloses a second playback state (forward play mode) (see column 3, lines 8 – 10) however Comer does not disclose wherein in a second playback state, said display buffer is selected based on a type of frame being decoded.

Wu discloses wherein in a second playback state (normal play) (see column 8, line 29), said display buffer (M1, M2, M3) is selected based on a type of frame being decoded (see column 8, lines 58 – 65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the step of selecting a display buffer based on a type of frame being decoded as taught by Wu to the apparatus of Comer in view of Schultz to provide a system for smoothly displaying reverse-play MPEG video while minimizing the required quantity of memory for temporary storage (See column 5, lines 40 – 43).

As to **claim 10**, Comer in view of Schultz and further in view of Wu discloses the method of claim 9. However Comer in view of Schultz does not disclose wherein said second playback state is one of a PLAY, FAST FORWARD or SLOW FORWARD state, and when a reference frame is being decoded a buffer storing a previous reference frame is selected for said display buffer, and when a non-reference frame is being decoded the frame being decoded is selected for said display buffer.

Wu discloses wherein said second playback state (normal play) is one of a PLAY (normal play) (see column 8, line 29), FAST FORWARD or SLOW FORWARD state, and when a reference frame (P3) is being decoded a buffer storing a previous reference (Io) frame is selected for said display buffer, and when a non-reference frame (B1, B2) is being decoded the frame being decoded is selected for said display buffer (see column 9, lines 1 – 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have added the step of wherein said second playback state is one of a PLAY, FAST FORWARD or SLOW FORWARD state, and when a reference frame is being decoded a buffer storing a previous reference frame is selected for said display buffer, and when a non-reference frame is being decoded the frame being decoded is selected for said display buffer taught by Wu to the apparatus of Comer in view of Schultz to provide a system that reduces the memory bandwidth requirements of the encoder system as much as possible to either reduce the cost or allow for increased performance (see column 5, lines 18 – 21).

As to **claim 11**, Comer in view of Schultz discloses the method of claim 1. However Comer in view of Schultz does not disclose further comprising changing a number of frame buffers while decoding and displaying digital video.

Wu discloses further comprising changing a number of frame buffers while decoding and displaying digital video (column 9, lines 22 - 24 discloses using three buffers during normal forward play mode whereas column 10, lines 33 - 35 discloses using five frame buffers during a fast reverse play mode).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have changed the number of frame buffers while decoding and displaying digital video as taught by Wu to the apparatus of Comer in view of Schultz to provide a system for smoothly displaying reverse-play MPEG video while minimizing the required quantity of memory for temporary storage (See column 5, lines 40 – 43).

As to **claim 12**, Comer in view of Schultz and further in view of Wu discloses the method of claim 11. However Comer in view of Schultz does not disclose wherein a number of frame buffers is changed as part of transitioning between said modes.

Wu discloses wherein a number of frame buffers is changed as part of transitioning between said modes (column 9, lines 22 - 24 discloses using three buffers during normal forward play mode whereas column 10, lines 33 - 35 discloses using five frame buffers during a fast reverse play mode).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have changed the number of frame buffers while decoding and displaying digital video as taught by Wu to the apparatus of Comer in view of Schultz to provide a system for smoothly displaying reverse-play MPEG video while minimizing the required quantity of memory for temporary storage (See column 5, lines 40 – 43).

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Comer in view of Schultz as applied to claim 1 above, and further in view of Schoner et al (US 6,072,548).

As to **claim 6**, Comer in view of Schultz discloses the method of claim 5. However Comer in view of Schultz does not disclose wherein selecting a free buffer comprises selecting a free buffer having a greatest history value for said decode buffer, and further comprising when a decode buffer is selected, resetting the history value of said decode buffer and increasing the history value of all other buffers.

Schoner discloses wherein selecting a free buffer (see column 11, lines 23 – 26) comprises selecting a free buffer having a greatest history value for said decode buffer (see column 5, lines 57 – 60 and column 9, lines 21 – 29.Greatest history value is number 1), and further comprising when a decode buffer is selected, resetting the history value (number 0) (see column 9, lines 21 – 29) of said decode buffer and increasing the history value of all other buffers (see column 10, lines 39 - 53) .

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the step of selecting a free buffer having a greatest history value for said decode buffer, and further comprising when a decode buffer is selected, resetting the history value of said decode buffer and increasing the history value of all other buffers as taught by Schoner to the apparatus of Comer in view of Schultz to reduce the memory requirements of the decoder system as much as possible to reduce its size and cost (see column 5, lines 31 – 34).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,222,979 B1 discloses a memory control in Trick Play Mode.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to OLUWASEUN A. ADEGEYE whose telephone number is (571)270-1711. The examiner can normally be reached on Monday - Friday 7:30 - 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

05/23/2008
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